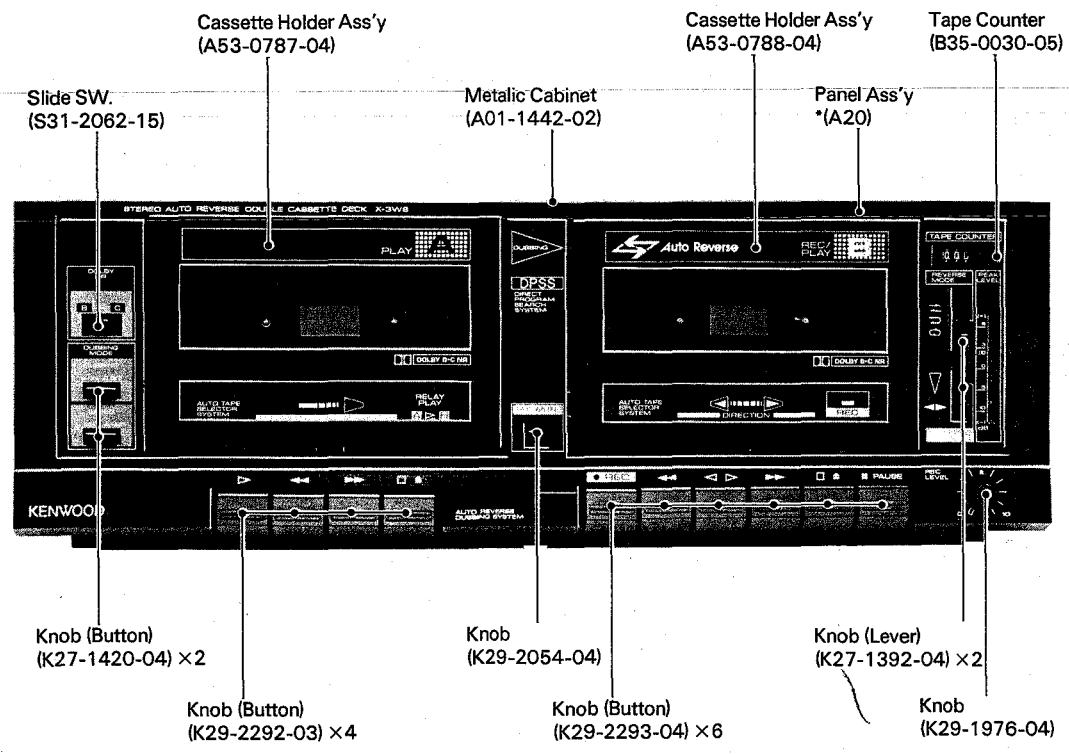
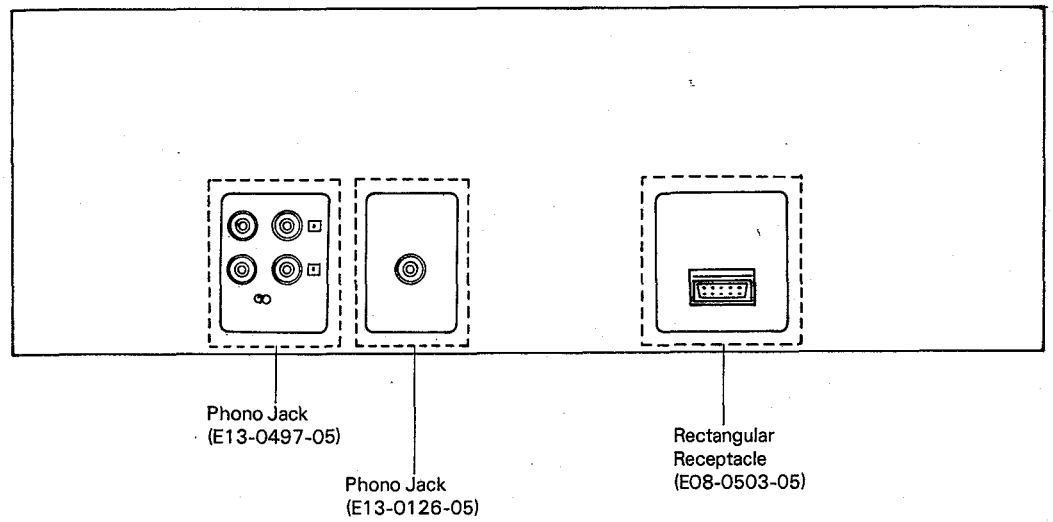
SERVICE MANUAL

KENWOOD

X-3WS

STEREO AUTO REVERSE DOUBLE CASSETTE DECK

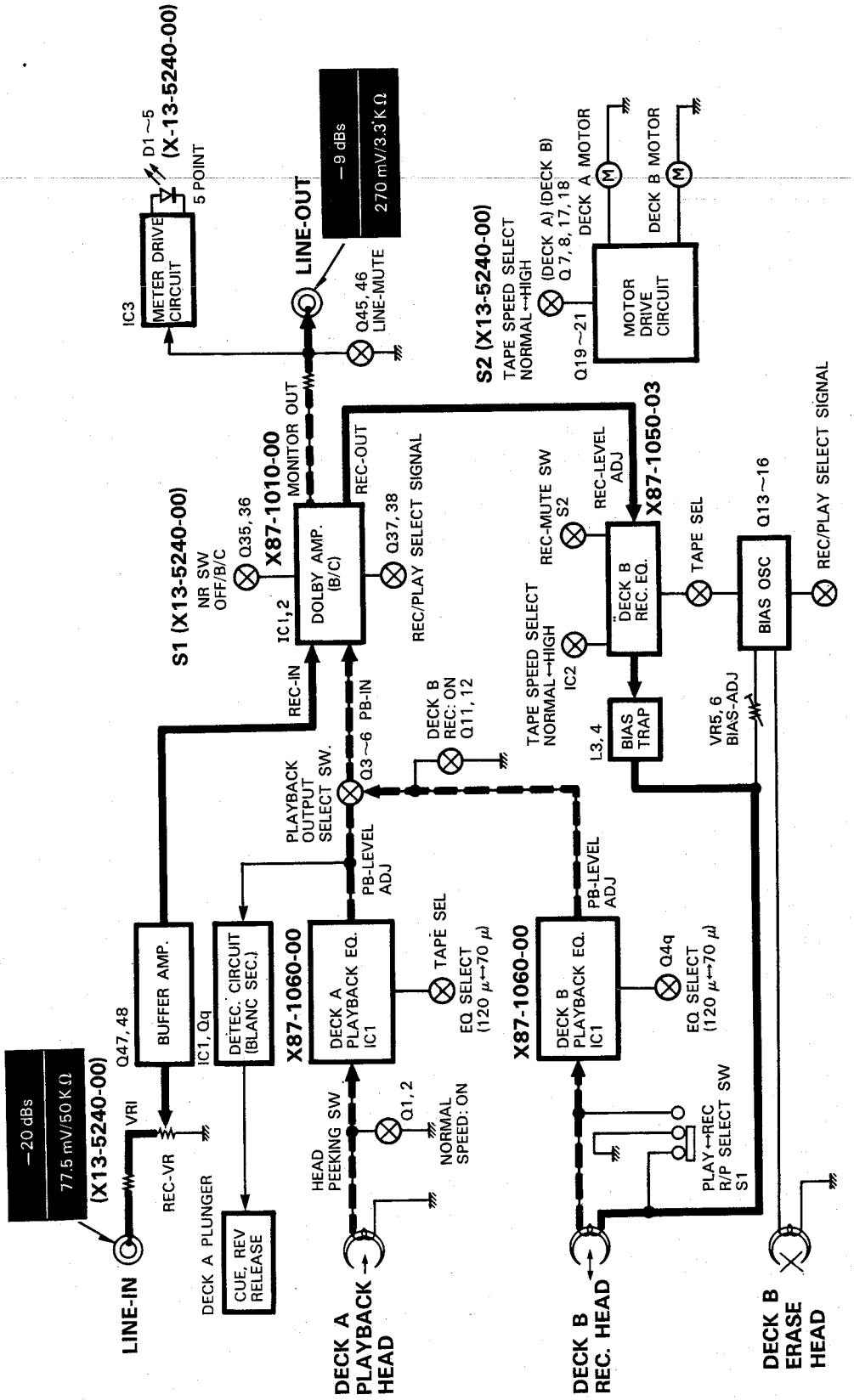




Caution **When a repair to MIDI M-3S is requested, be sure to advise the customer to ship together with amplifier A-5S.**
See precautions for repair on back cover.

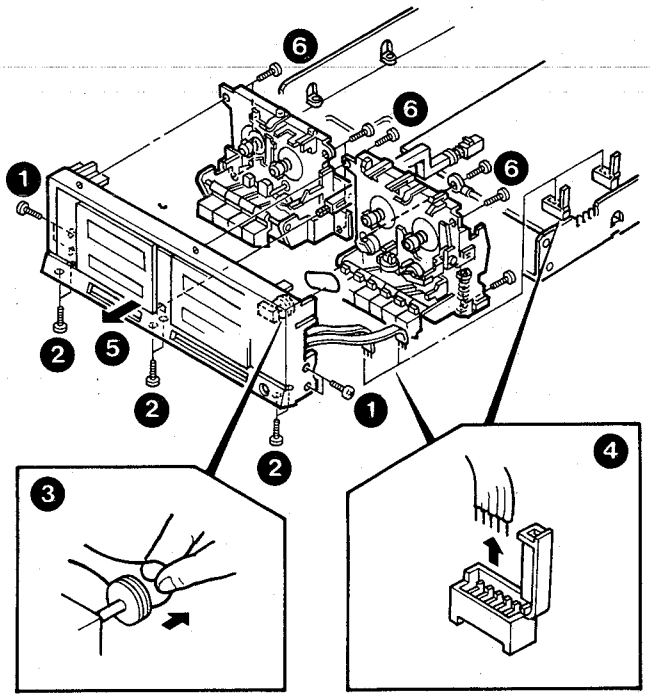
*** Refer to parts list on page 11.**

BLOCK LEVEL DIAGRAM



DISASSEMBLY FOR REPAIR

1. Remove the screws (❶ and ❷) from the front panel.
2. Remove the belt (❸) and the connectors (❹).
3. Pull out the front panel (❺), paying attention to the REC MUTE knob.
4. Remove the A and B mechanism screws (❻), then remove the mechanisms.



CIRCUIT DESCRIPTION

Function of Components

Recording/Playback Unit (X-28-1750-00)

Component	Use/Function	Operation/Conditions/Interchangeability
Q1, 2	Deck A playback head peaking capacitor selection	Normal Speed: ON High speed: OFF
Q3~6	Playback amp. A/B selection	Deck A PLAY: Q3, 4 ON STOP and Deck B PLAY: Q5, 6 ON
Q7, 8	Deck A motor speed selection	Normal speed: Q7, 8 ON High speed: Q7, 8 OFF
Q9	Deck A program selection operation plunger driving	During program selection operation (Cue, Rev.): Q9 ON
Q11, 12	Dubbing bias leakage protection circuit	Deck B REC: Q11, 12 ON
Q13	Bias generation circuit	
Q14, 15	Bias current selection	Normal tape: Q14, 15 OFF Chrome tape: Q14 OFF, Q15 ON Metal tape: Q14 ON, Q15 OFF
Q16	Bias ON/OFF selection	Deck B REC: Q16 ON (bias generation) STOP, PLAY: Q16 OFF
Q17, 18	Deck B motor speed selection	Normal speed: Q17, 18 ON High speed: Q17, 18 OFF
Q19, 20	Deck B motor control circuit	Dubbing SW OFF A Deck STOP: Q19 ON, Q20 OFF A Deck PLAY: Q19 OFF, Q20 ON Dubbing SW ON A Deck STOP: Q19 OFF, Q20 ON A Deck PLAY: Q19 ON, Q20 OFF
Q21	Deck B motor control circuit	Deck B REC or dubbing SW ON (Deck A PLAY): Q21 ON→Q20 OFF, Q19 ON Dubbing SW ON (Deck A STOP), turntable (P-3S) or CD player (DP-7S) PLAY: Q21 ON→Q20 OFF, Q19 ON
Q22	Deck B tape direction indicator selection	FORWARD: Q22 OFF REVERSE: Q22 ON
Q23~26	Playback amp A/B selection control circuit	Deck A PLAY: Q23, 24, 26 ON, Q25 OFF→Q3, 4 ON STOP and Deck B PLAY: Q23, 24, 26 OFF, Q25 ON→Q5, 6 ON
Q27	Deck A STOP/PLAY selection mute signal	Deck A STOP: Q27 OFF PLAY: Q27 ON

CIRCUIT DESCRIPTION

Recording/Playback Unit (X28-1750-00)

Component	Use/Function	Operation/Conditions/Interchangeability
Q47, 48	Line input buffer amp	Emitter follower circuit (voltage gain = 0 dB)
Q49	Deck B tape selector circuit	Normal, chrome: Q49 OFF Metal: Q49 ON
Q50	CD synchronizing signal control circuit	Deck A PLAY: Q50 ON
Q51	Turntable synchronizing signal control circuit	Deck A PLAY: Q50 ON
IC1	Deck A program selection plunger control	1 pin: Deck A playback signal input pin (L + R) 6 pin: Plunger control signal When Deck A playback signal is present: L level When playback signal is not present: H level
IC2	Deck B recording equalizer selection circuit	1, 2 pins: normal speed — H level 3, 4 pins: high speed — H level 5 pin: GND 6 pin: normal speed, chrome tape — H level 7 pin: normal speed, metal tape — H level 8 pin: high speed, chrome tape — H level 9 pin: high speed, metal tape — H level
IC3	Level meter circuit	2 pin: L channel line signal input pin 3 pin: R channel line signal input pin 9 pin: —10 dB indicator (LED on when at H level) 10 pin: —5 dB indicator (LED on when at H level) 11 pin: 0 dB indicator (LED on when at H level) 12 pin: +3 dB indicator (LED on when at H level) 13 pin: +6 dB indicator (LED on when at H level)

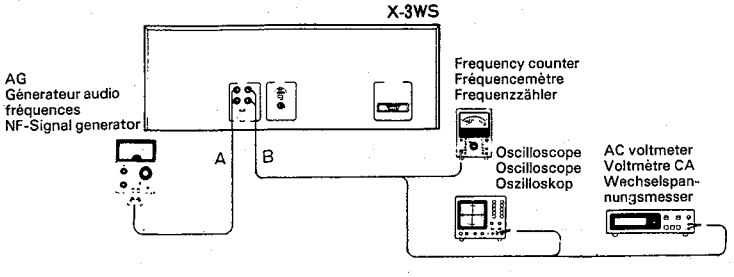
Daughter Units

Component	Use/Function	Operation/Conditions/Interchangeability
X87-1010-00 IC1, 2	Dolby amp unit Dolby amp circuit	29 pin: REC/PLAY selection 0 V — PLAY mode (Dolby decoder operation) 4.1 V — REC mode (Dolby encoder operation) 30 pin: Dolby selection 4.6 V — Dolby OFF 7.5 V — Dolby B ON 10.2 V — Dolby C ON
X78-1050-03 Q1 Q2 IC1	Recording amp unit Record muting circuit Recording amp circuit Recording equalizer selection circuit	X28-1750-00 Q29 or Q39 ON, SW2 ON (REC-MUTE): Q1 ON (REC mute ON) Emitter ground amplification circuit Controlled by X28-1750-00 IC2
X87-1060-00 Q1, 2 IC1	Playback amp unit Playback NAB constant selection circuit Playback amp circuit	Normal tape: OFF (3180 μ, 120 μ) Chrome, metal tape: ON (3180 μ, 70 μ)

ADJUSTMENT

No.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	CASSETTE TAPE DECK SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
CASSETTE DECK SECTION		TAPE: NORMAL, DOLBY: OFF INPUT: LINE				0dBs=0.775V	
I REC/PLAY HEAD							
[1]	DEMAGNETIZATION	–	–	POWER: OFF Remove the cassette door.	REC/PLAY head	Demagnetize the REC/PLAY head with a head demagnetizer.	
[2]	CLEANING	–	–	PLAY	REC/PLAY head erase head, capstan, pinch roller.	Clean the REC/PLAY head erase head, capstan and pinch roller using a cotton swab slightly damped with alcohol.	
[3]	AZIMUTH	MTT-114	(B)	PLAY	Azimuth adjustment screw	Maximum output.	
II PC BOARD							
<i>	TAPE SPEED (HI SPEED)	MTT-111 3kHz	(B)	Connect the TP1,TP2 to GND PLAY	A DECK: VR2 B DECK: VR4	Adjust the tape speed so that a 6kHz signal is produced at the center of the tape.	
<ii>	TAPE SPEED (NORMAL)	MTT-111 3kHz	(B)	Disconnect the TP1,TP2 PLAY	A DECK: VR1 B DECK: VR3	Adjust the tape speed so that a 3kHz signal is produced at the center of the tape.	
III PC.BOARD (X87-1060-00)							
<1>	PLAYBACK LEVEL	(a) MTT-150 400Hz	(B)	PLAY	A DECK: VR1 (L) VR2 (R) B DECK: VR1 (L) VR2 (R)	Output level: -6.0dBs	
		(b) MTT-256 315Hz				Output level: -9.0dBs	
		(c) MTT-256U 315Hz				Output level: -5.0dBs	
<2>	BIAS CURRENT	(A) 1kHz,-30dBs 10kHz,-30dBs	(B)	Adjust REC so that the REC monitor output becomes -29dBs at 1kHz, then record and reproduce signal of 1kHz and 10kHz in alternation.	(X28-1750-00) VR5 (L) VR6 (R)	Record 1kHz and 10kHz in alternation and adjust the variable resistors which control the bias current so that the same playback level is obtained.	
<3>	RECORD LEVEL	(A) 1kHz,-10dBs	(B)	Record and reproduce a 1kHz signal under the conditions set in <2>.	(X87-1050-00) VR1 (L) VR1 (R)	Adjust the variable resistors so that a playback level of -9dBs is obtained.	

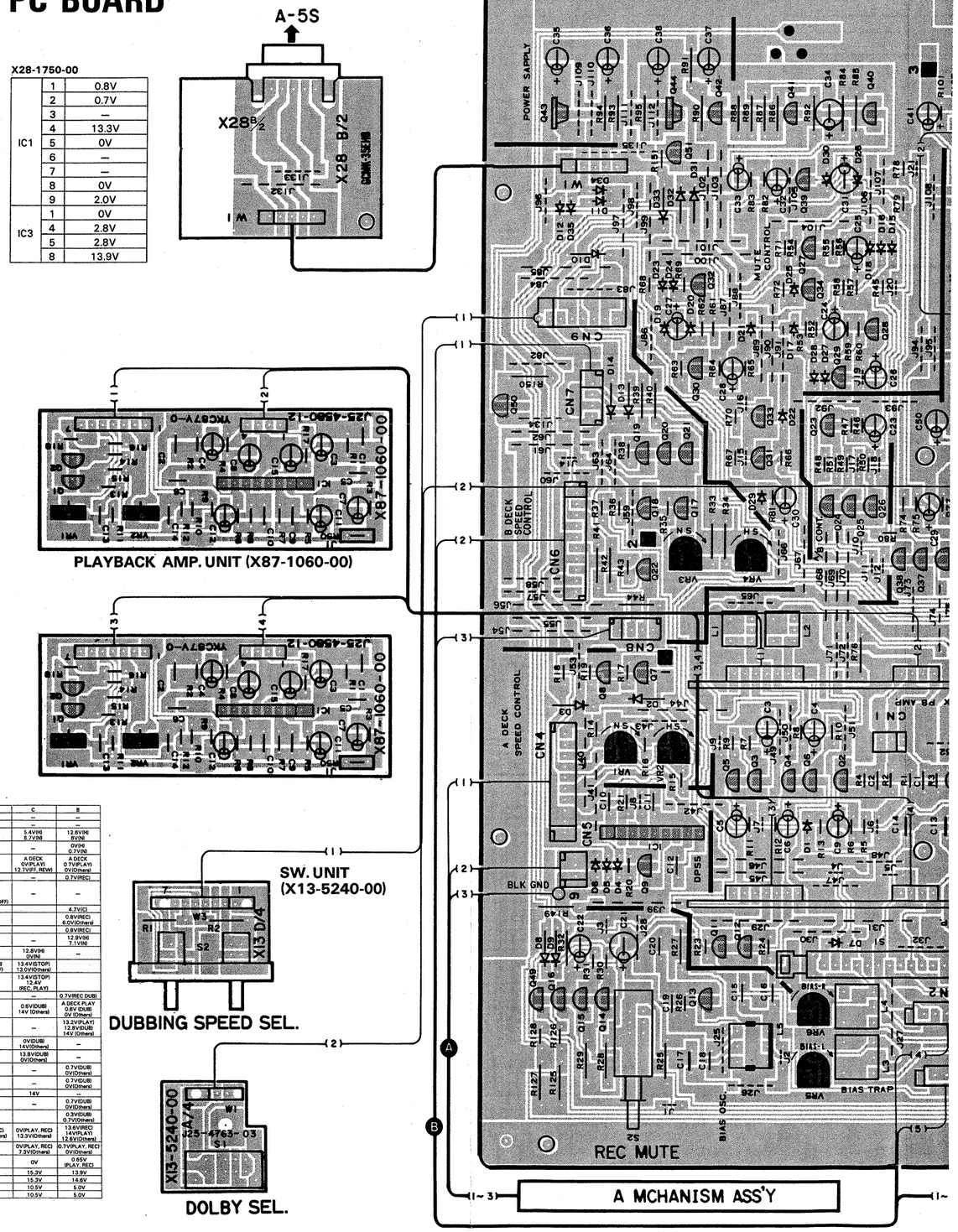
SYSTEM CONNECTIONS



ABGLEICH

NR.	GEGENSTAND	EINGANGS-EINSTELLUNG	AUSGANGS-EINSTELLUNG	KASSETTENGERÄT-EINSTELLUNG	ABGLEICH PUNKTE	ABGLEICHEN FÜR	ABB.
CASSETTEN-DECK-ABTEILUNG TAPE: NORMAL, DOLBY: OFF, EINGANG: LINE						0dBs=0,775V	
I AUFNAHME/WIEDERGABE-KOPF							
[1]	ENTMAGNETISIERUNG	–	–	POWER: OFF Den Kassettenfach deckel oben herausziehen.	AUFNAHME/ WIEDERGABE-Kopf	Entmagnetisierung von dem AUFNAHME/WIEDERGABE-Kopf mit einem Tonkopf Entmagnetisierungsdrossel.	
[2]	REINIGUNG	–	–	PLAY	AUFNAHME/ WIEDERGABE-Kopf Löschkopf, Tonwelle, Andruckrolle.	AUFNAHME/WIEDERGABE-Kopf, Löschkopf, Tonwelle und Andruckrolle mit einem leicht mit Alkohol befeuchteten Wattebausch reinigen.	
[3]	AZIMUT-EINSTELLUNG	MTT-114 10kHz	(B)	PLAY	Azimut-Einstellschraube	Maximal Ausgang.	
II GEDRUCKTE SCHALTPLATTE							
<i>	BANDGESCHWINDIGKEIT (HI SPEED)	MTT-111 3kHz	(B)	Einen Schaltdraht zwischen GND und TP1.TP2 anschließen. PLAY	A DECK: VR2 B DECK: VR4	Die Bandgeschwindigkeit so justieren, daß ein 6kHz Signal auf der Mitte des Bands erzeugt wird.	
<ii>	BANDGESCHWINDIGKEIT (NORMAL)	MTT-111 3kHz	(B)	Disconnect the TP1.TP2 anschließen. PLAY	A DECK: VR1 B DECK: VR3	Die Bandgeschwindigkeit so justieren, daß ein 3kHz Signal auf der Mitte des Bands erzeugt wird.	
III GEDRUCKTE SCHALTPLATTE (X87-1060-00)							
<1>	WIEDERGABE-PEGEL	(a) MTT-150 400Hz	(B)	PLAY	A DECK: VR1 (L) VR2 (R) B DECK: VR1 (L) VR2 (R)	Ausgangspegel: -6,0dBs	
		(b) MTT-256 315Hz				Ausgangspegel: -9,0dBs	
		(c) MTT-256U 315Hz				Ausgangspegel: -5,0dBs	
<2>	LEERLAUFSTROM	(A) 1kHz.-30dBs 10kHz.-30dBs	(B)	REC so justieren, daß der REC Monitorausgang -29dBs bei 1kHz wird, und danach abwechselnd Signale von 1kHz und 10kHz aufnehmen und wiedergeben.	(X28-1750-00) VR5 (L) VR6 (R)	Signale von 1kHz und 10kHz abwechselnd aufnehmen und die Regelwiderstände, die den Vormagnetisierugsstrom regeln, so justieren, daß der gleiche Wiedergabepegel erzielt wird.	
<3>	AUFNAHMEPEGEL	(A) 1kHz.-10dBs	(B)	Ein 1kHz Signal unter den in Punkt <2> beschriebenen Bedingungen aufnehmen und reproduzieren.	(X87-1050-00) VR1 (L) VR1 (R)	Die Regelwiderstände so justieren, daß ein wiedergabepegel von -9dBs erzielt wird.	

PC BOARD



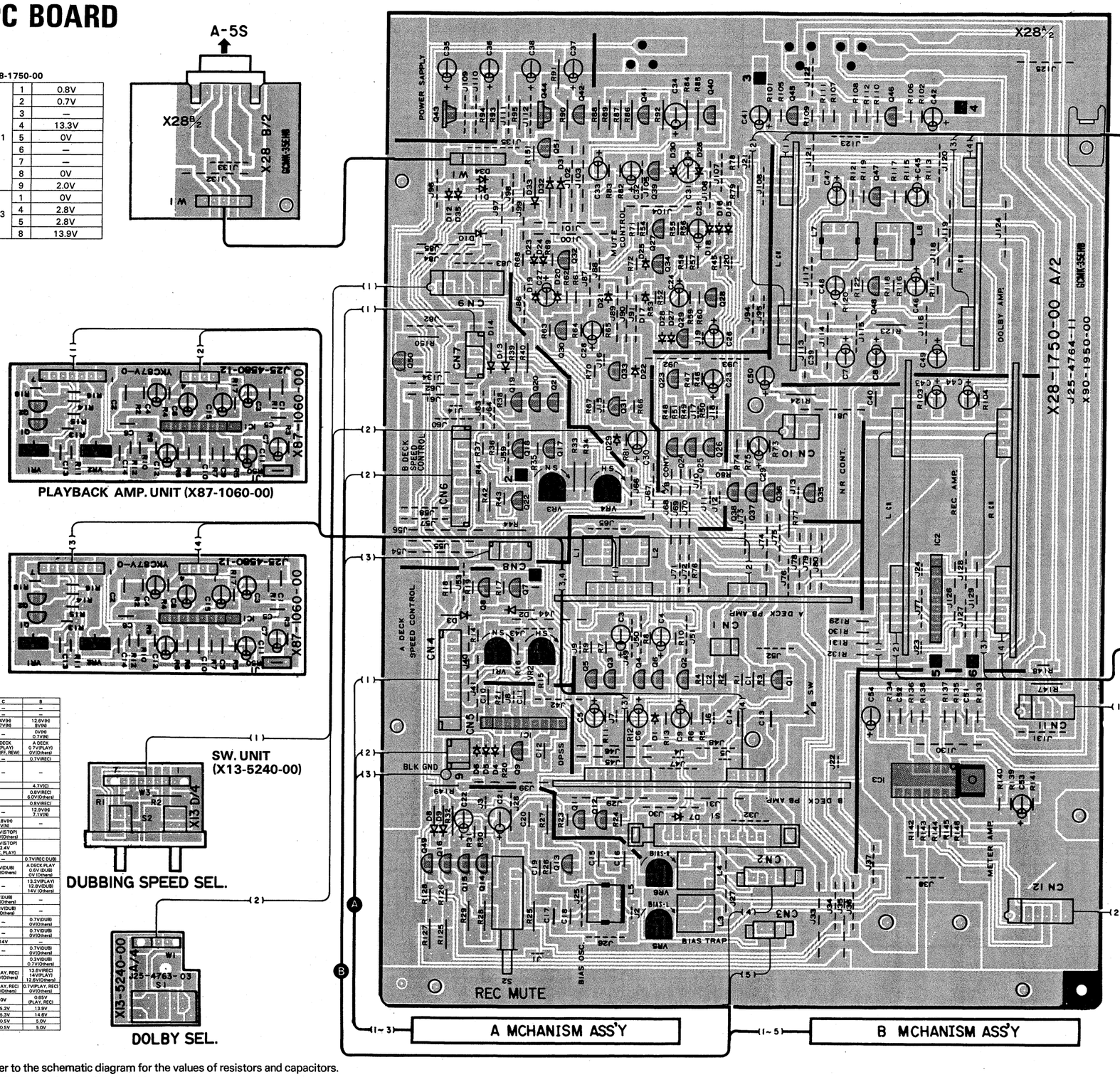
	E	C	B
Q1	0V	–	–
Q2	0V-	–	–
Q7	10.5V(H) 8.7V(N)	5.4V(H) 8.7V(N)	12.6V(H) 8V(N)
Q8	–	–	0V(H) 0.7V(N)
Q9		A DECK 0V(PLAY) 12.7V(F. REW)	A DECK 0.7V(PLAY) 0V(Others)
Q11,12	–	–	0.7V(REC)
Q13	4.1V(M) 5.8V(C) 8.1V(N) 13.4V(REC OFF)	–	–
Q14			4.7V(C)
Q15			0.8V(REC) 5.0V(Others)
Q16			0.8V(REC)
Q17	10V(H) 7.8V(N)	–	12.9V(H) 7.1V(N)
Q18	–	12.8V(H) 0V(N)	–
Q19	11.7V(ON) 13.0V(OFF)	13.4V(STOP) 13.0V(Others)	
Q20		13.4V(STOP) 12.4V (REC, PLAY)	
Q21	–		0.7V(REC DUB)
Q23	0V	0.6V(DUB) 14V (Others)	A DECK PLAY 0.6V (DUB) 0V (Others)
Q24	–	–	13.2V(PLAY) 12.9V(DUB) 14V (Others)
Q25	–	0V(DUB) 14V(Others)	–
Q26	–	13.8V(DUB) 0V(Others)	–
Q27	–	–	0.7V(DUB) 0V(Others)
Q28	–	–	0.7V(DUB) 0V(Others)
Q30	0V	14V	–
Q35	–	–	0.7V(DUB) 0V(Others)
Q38			0.3V(DUB) 0.7V(Others)
Q39	12.7V(REC) 13.2V(Others)	0V(PLAY, REC) 13.3V(Others)	13.6V(REC) 14V(PLAY) 12.6V(Others)
Q41	0V	0V(PLAY, REC) 7.3V(Others)	0.7V(PLAY, REC) 0V(Others)
Q42	0V	0V	4.65V (PLAY, REC)
Q43	13.3V	15.3V	13.9V
Q44	14V	15.3V	14.6V
Q47	4.4V	10.5V	5.0V
Q48	4.4V	10.5V	5.0V

Refer to the schematic diagram for the values of resistors and capacitors.
The PC board drawing is viewed from the side easy to check.

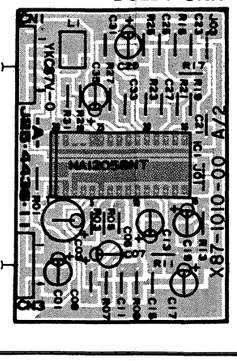
PC BOARD

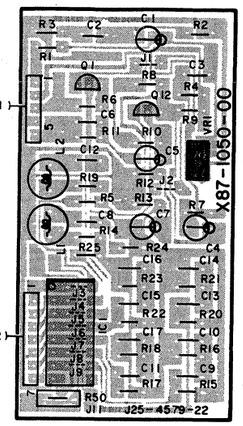
X28-1750-00

IC1	1	0.8V
	2	0.7V
	3	—
	4	13.3V
	5	0V
	6	—
	7	—
	8	0V
	9	2.0V
IC3	1	0V
	4	2.8V
	5	2.8V
	8	13.9V



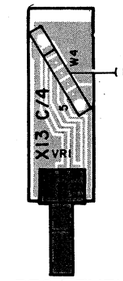
	E	C	B
Q1	0V	—	—
Q2	0V	—	—
Q7	10.5V(9) 9.7V(9)	5.4V(9) 9.7V(9)	12.6V(9) 9V(9)
Q8	—	—	0V(9) 0.7V(9)
Q9		A DECK 0V(PLAY) 12.7V(FF, REW)	A DECK 0.7V(PLAY) 0V(Others)
Q11,12	—	—	0.7V(REC)
Q13	4.1V(M) 5.6V(C) 8.1V(9) 13.4V(REC OFF)	—	—
Q14			4.2V(C)
Q15			0.8V(REC) 6.0V(Others)
Q16			0.8V(REC)
Q17	10V(9) 7.8V(9)	—	12.9V(9) 7.1V(9)
Q18	—	12.8V(9) 0V(9)	—
Q19	11.7V(ON) 13.0V(OFF)	13.4V(STOP) 13.0V(Others)	
Q20		13.4V(STOP) 12.4V (REC, PLAY)	
Q21	—	—	0.7V(REC DUB)
Q23	0V	0.6V(DUB) 14V (Others)	A DECK PLAY 0.6V (DUB) 0V (Others)
Q24	—	—	13.2V(PLAY) 12.9V(DUB) 14V (Others)
Q25	—	0V(DUB) 14V(Others)	—
Q26	—	13.8V(DUB) 0V(Others)	—
Q27	—	—	0.7V(DUB) 0V(Others)
Q28	—	—	0.7V(DUB) 0V(Others)
Q30	0V	14V	—
Q35	—	—	0.7V(DUB) 0V(Others)
Q38			0.3V(DUB) 0.7V(Others)
Q39	13.7V(REC) 13.3V(Others)	0V(PLAY, REC) 13.3V(Others)	13.6V(REC) 14V(PLAY) 12.6V(Others)
Q41	0V	0V(PLAY, REC) 7.3V(Others)	0.7V(PLAY, REC) 0V(Others)
Q42	0V	0V	0.65V (PLAY, REC)
Q43	13.2V	15.3V	13.9V
Q44	14V	15.3V	14.6V
Q47	4.4V	10.5V	5.0V
Q48	4.4V	10.5V	5.0V





X87-1010-00

IC1	1	13.8V
	2	7.0V
	3	7.0V
	4	0V
	5	6.7V
	6	6.9V
	7	7.0V
	8	7.2V
	9	7.0V
	10	7.0V
	11	0V
	12	1.0V
	13	1.0V
	14	0.9V(C) 0V(9)
	15	6.0V
	16	7.5V
	17	8.8V
	18	6.9V
	19	6.8V
	20	6.8V
	21	1.0V
	22	1.0V
	23	7.2V
	24	6.9V
	25	7.0V
	26	7.0V
	27	NC
	28	NC
	29	0V(PLAY), 3.7V(REC)
	30	6.7V(9) 9.3V(C) 4.1V(OFF)

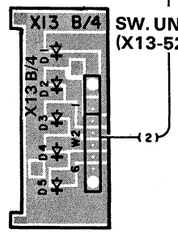


X87-1060-00 (DECK A)

IC1	1	1.3V
	2	0.8V
	3	3.7V
	4	9.3V
	5	—
	6	4.2V
	7	0.8V
	8	1.3V

X87-1060-00 (DECK B)

IC1	1	0V
	2	0V
	3	0V
	4	9.3V
	5	—
	6	0V
	7	0V
	8	0V

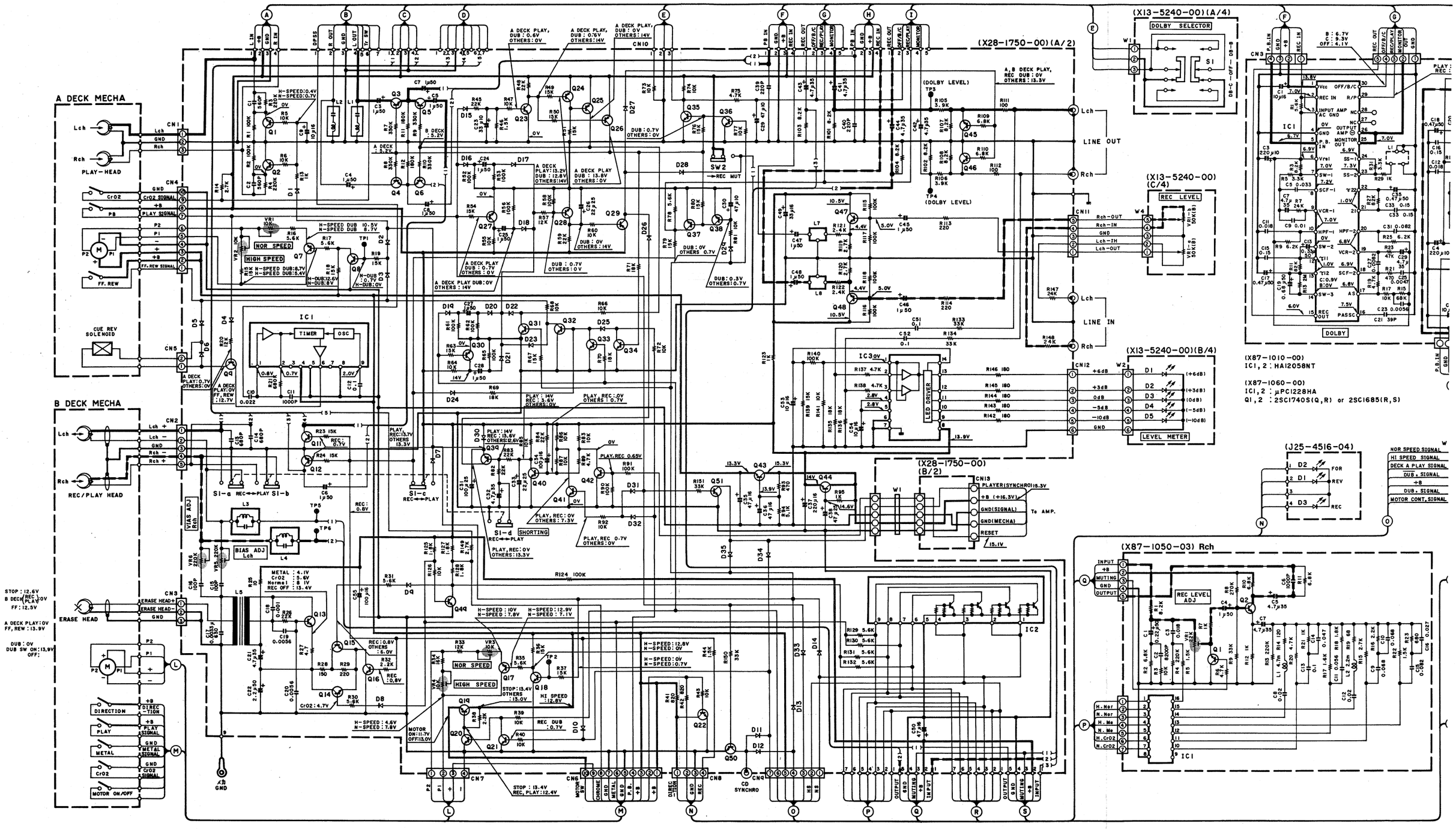


X87-1050-03 (Lch)

	E	C	B
Q1			0.3V (PLAY, REC) 0.7V(Others)
Q2	0.8V	8.0V	1.4V

X-3WS

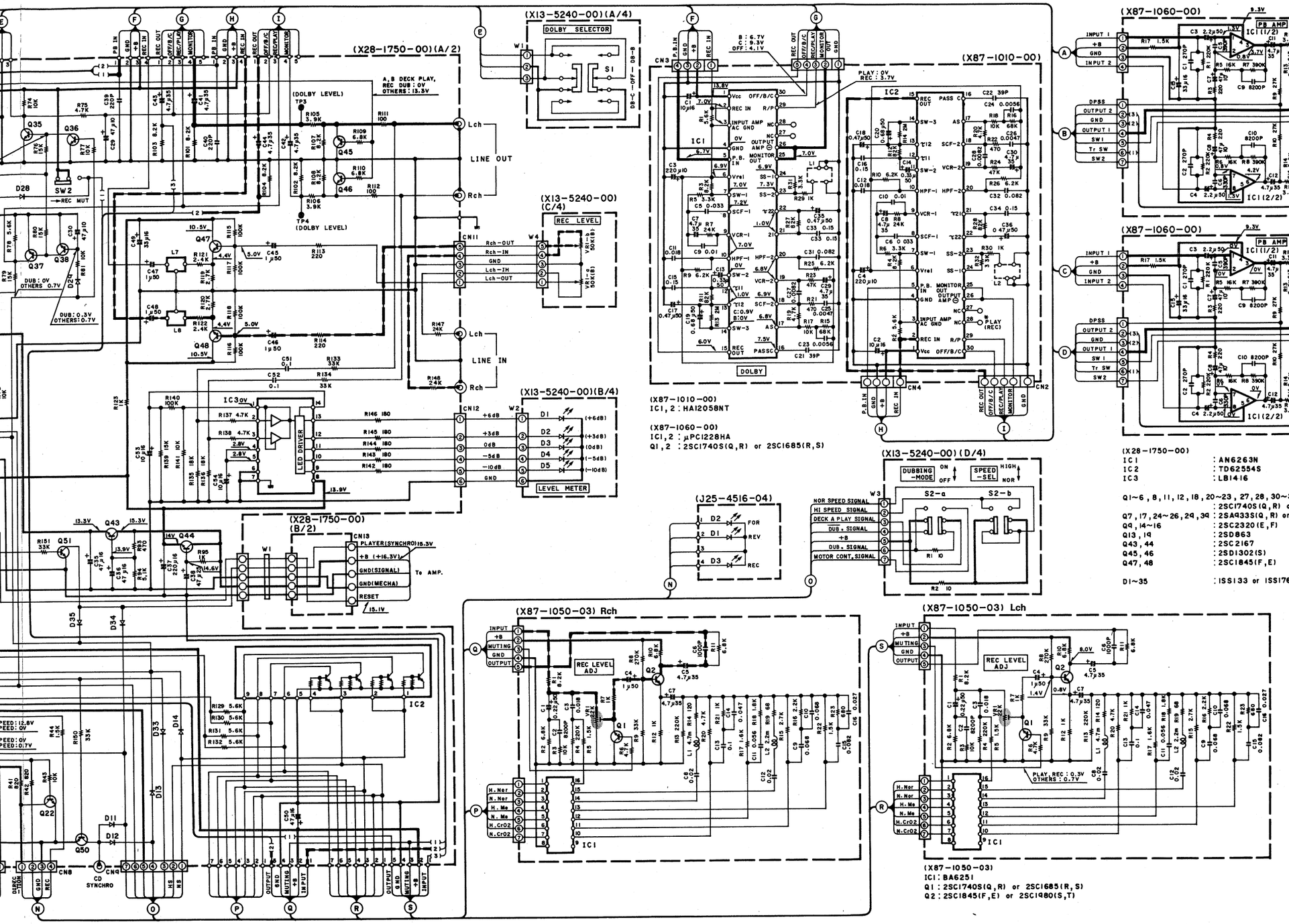
Refer to the schematic diagram for the values of resistors and capacitors.
The PC board drawing is viewed from the side easy to check.



CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

- DC voltages are as measured with a high impedance voltmeter with a cassette loaded at playback mode. Values may vary slightly due to variations between individual instruments or/and units. Bias circuit DC voltages are as measured while in the record mode.

- Les tensions c.c. doivent être mesurées a à haute impédance, une cassette étant ins lecture. Les valeurs peuvent différer légère variations inhérentes aux appareils et au mesure individuels. Les tensions c.c. du c doivent être mesurées, l'appareil é d'enregistrement.



(X87-1010-00)
IC1, 2 : HA12058NT

(X87-1060-00)
IC1, 2 : μPC1228HA
Q1, 2 : 2SC1740S(Q,R) or 2SC1685(R,S)

(X28-1750-00)

IC1	: AN6263N
IC2	: TD62554S
IC3	: LB1416
Q1~6, 8, 11, 12, 18, 20~23, 27, 28, 30~38, 40~42, 44~51	: 2SC1740S(Q,R) or 2SC945(A)(Q,P)
Q7, 17, 24~26, 29, 39	: 2SA933S(Q,R) or 2SA733(A)(Q,P)
Q9, 14~16	: 2SC2320(E,F)
Q13, 19	: 2SD863
Q43, 44	: 2SC2167
Q45, 46	: 2SD1302(S)
Q47, 48	: 2SC1845(F,E)
D1~35	: 1SS133 or 1SS176

(X87-1050-03)
IC1 : BA6251
Q1 : 2SC1740S(Q,R) or 2SC1685(R,S)
Q2 : 2SC1845(F,E) or 2SC1980(S,T)

1SS133
1SS176

2SA733(A)
2SC1685
2SC1845
2SC1980
2SC2320
2SC945(A)
2SD1302
2SD863

2SC2167

2SA933S
2SC1740S

AN6263N

LB1416

TD62554S

BA6251

UPC1228HA

HA12058NT

X-3WS (E)

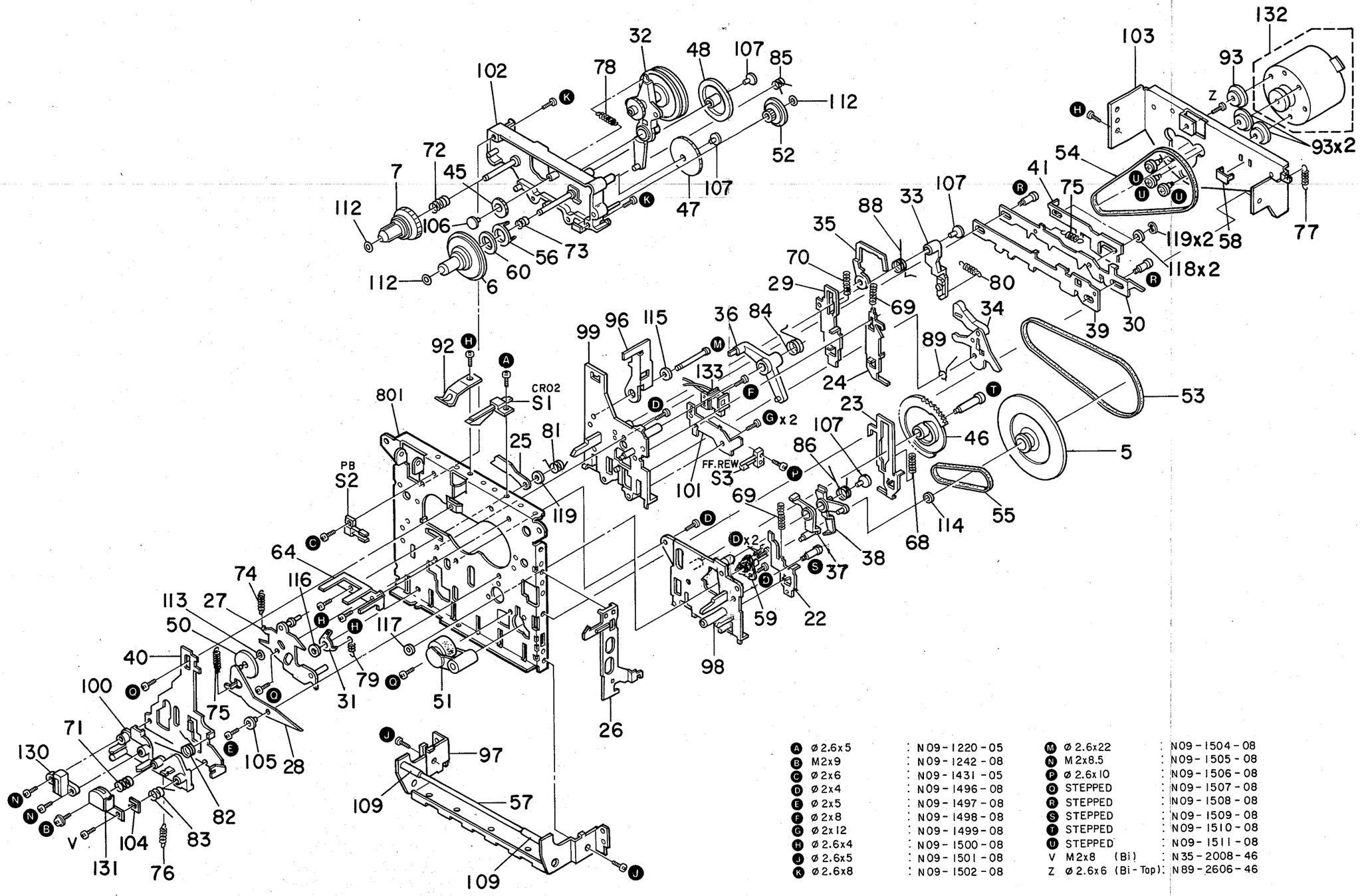
CAUTION: For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list). Indicates safety critical components. To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

- DC voltages are as measured with a high impedance voltmeter with a cassette loaded at playback mode. Values may vary slightly due to variations between individual instruments or/and units. Bias circuit DC voltages are as measured while in the record mode.
- Les tensions c.c. doivent être mesurées avec un voltmètre à haute impédance, une cassette étant insérée en mode du lecture. Les valeurs peuvent différer légèrement du fait des variations inhérentes aux appareils et aux instruments de mesure individuels. Les tensions c.c. du circuit de polarité doivent être mesurées, l'appareil étant en mode d'enregistrement.
- Die angegebenen Gleichspannungswerte wurden bei eingesetzter Cassette in der Wiedergabe mit einem hochohmigen Spannungsmesser gemessen. Dabei schwanken die Meßwerte aufgrund von Unterschieden zwischen einzelnen Instrumenten oder Geräten u. U. geringfügig. Die angegebenen Gelichspannungswerte der Vormagnetisierungsschaltung wurden in der Aufnahme-Betriebsart gemessen.

X-3WS

KENWOOD

EXPLODED VIEW(MECHANISM)



A	Ø2.6x5	: N09-1220-05	M	Ø2.6x22	: N09-1504-08
B	M2x9	: N09-1242-08	N	M2x8.5	: N09-1505-08
C	Ø2x6	: N09-1431-05	P	Ø2.6x10	: N09-1506-08
D	Ø2x4	: N09-1496-08	Q	STEPPED	: N09-1507-08
E	Ø2x5	: N09-1497-08	R	STEPPED	: N09-1508-08
F	Ø2x8	: N09-1498-08	S	STEPPED	: N09-1509-08
G	Ø2x12	: N09-1499-08	T	STEPPED	: N09-1510-08
H	Ø2.6x4	: N09-1500-08	U	STEPPED	: N09-1511-08
J	Ø2.6x5	: N09-1501-08	V	M2x8 (Bi)	: N35-2008-46
K	Ø2.6x8	: N09-1502-08	Z	Ø2.6x6 (Bi-Top)	: N89-2606-46

X-3WS

Parts with the exploded numbers larger than 700 are not supplied.

EXPLODED VIEW(MECHANISM)

A		: N09-1487-08	M	W (3x1.7x0.5)	: N19-0930-08
B	M1.6x5.5	: N09-1488-08	N	W (1.7x3.5x0.2)	: N19-0931-08
C	ø2x5	: N09-1489-08	P	ER (ø1.5)	: N29-0205-04
D	ø2.6x3	: N09-1490-08	Q	ER (ø2.0)	: N29-0206-04
E	W (1.7x3.5x0.2)	: N09-0298-05	R	ER (ø2.5)	: N29-0207-04
F	W (2.5x4.5x0.5)	: N19-0367-08	S	M2.6x5	: N35-2605-46
G	W (6x2.1x0.25)	: N19-0524-04	T	M2x3	: N39-2003-46
H	W (2.6x4.7x0.5)	: N19-0891-04	U	M2x4	: N39-2004-46
K	W (5x8x0.5)	: N19-0928-08	Y	M2.6x4	: N39-2604-46
L	W (3.4x8x0.5)	: N19-0929-08	W	ø2.6x14 (Bi-Tap)	: N89-2614-46

X-3WS

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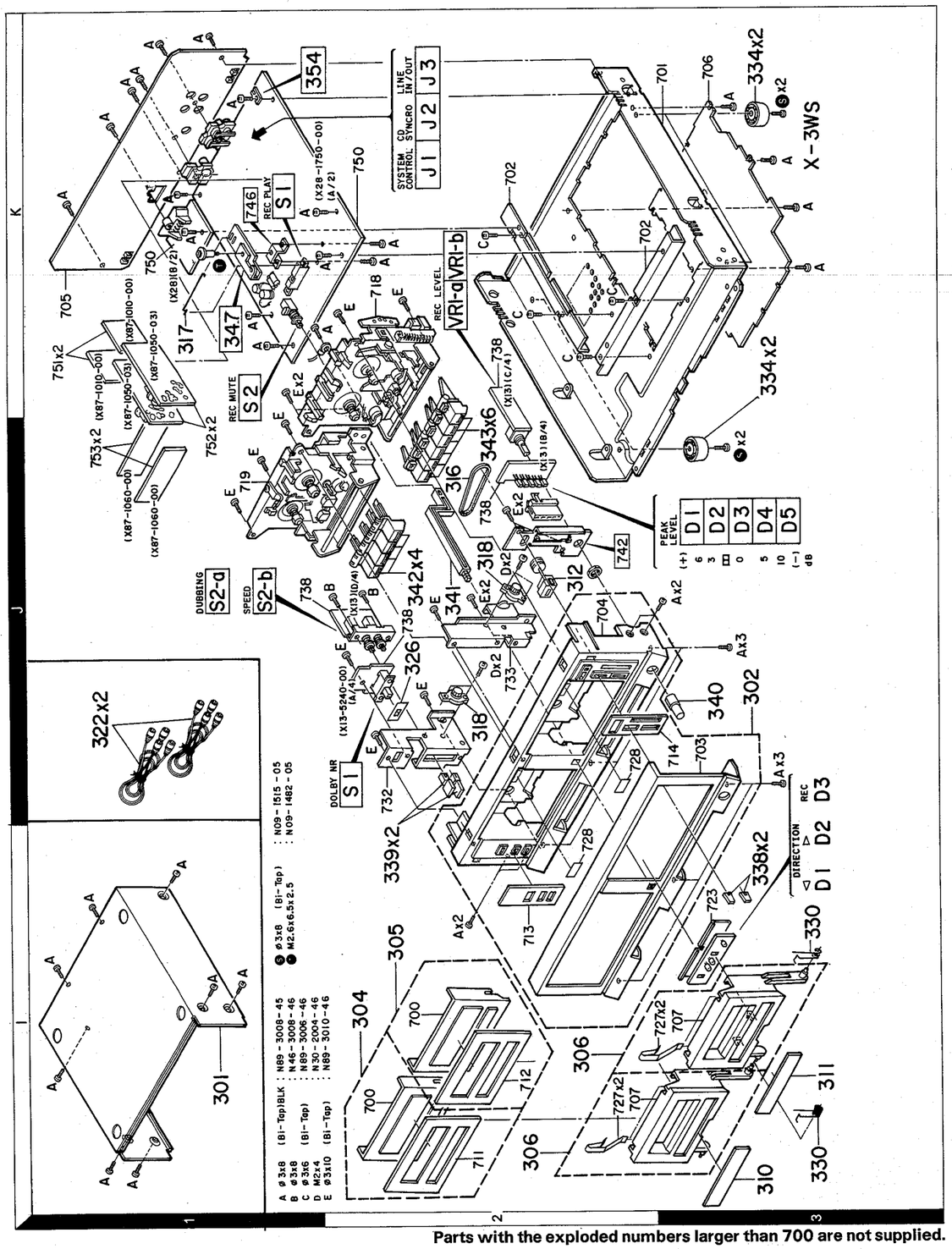
EXPLODED VIEW(UNIT)



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			X-3WS			
301	1I		A01-1442-02	METALLIC CABINET		
302	2J	*	A20-4712-02	PANEL ASSY	UMUEE	
302	2J	*	A20-4713-02	PANEL ASSY	T	
304	1I	*	A53-0787-04	CASSETTE HOLDER ASSY (A)		
305	1I	*	A53-0788-04	CASSETTE HOLDER ASSY (B)		
306	2I	*	A53-0802-04	CASSETTE HOLDER ASSY		
310	2I	*	B03-1921-04	DRESSING PLATE (A)		
311	2I	*	B03-1922-04	DRESSING PLATE (B)		
312	2J		B35-0030-05	TAPE COUNTER		
-			B46-0094-03	WARRANTY CARD	UUE	
-			B46-0095-03	WARRANTY CARD	UUE	
-			B46-0122-13	WARRANTY CARD	E	
-			B46-0123-03	WARRANTY CARD	T	
-			B59-0092-00	SERVICE DIRECTORY	UUE	
D1 ,2	2I		B30-1010-05	LED(SLP-281F-50U) DIRECTION		
D3	2J		B30-1012-05	LED(SLP-981C-50) REC		
316	2J		D16-0221-04	BELT		
317	1K		D22-0053-04	SHAFT COUPLING		
318	2J		D39-0173-05	DAMPER		
322	1J		E30-0615-05	AUDIO CORD		
326	1J		F19-0335-04	BLIND PLATE (DOLBY NR)		
330	2I	*	G01-1750-04	TORSION COIL SPRING (HOLDER)		
-		*	H01-7064-04	ITEM CARTON CASE	UMUEE	
-		*	H01-7065-04	ITEM CARTON CASE	T	
-		*	H10-1835-02	POLYSTYRENE FOAMED FIXTURE		
-		*	H10-1836-02	POLYSTYRENE FOAMED FIXTURE		
-			H20-0417-04	PROTECTION COVER(460X370X360)	M	
-			H25-0223-04	PROTECTION BAG (750X350)	UUETE	
-			H25-0232-04	PROTECTION BAG (235X350)		
334	2K		J02-0170-04	FOOT		
-			J61-0307-05	WIRE BAND		
338	2I		K27-1392-04	KNOB (LEVER) RVRS MODE,DIR		
339	1I		K27-1420-04	KNOB (BUTTON) DUBBING MODE		
340	2J		K29-1976-04	KNOB (REC LEVEL)		
341	2J		K29-2054-04	KNOB (REC MUTE)		
342	1J	*	K29-2292-03	KNOB (BUTTON) A		
343	2J	*	K29-2293-04	KNOB (BUTTON) B		
S	2J,2K		N09-1515-05	TAPPING SCREW (3X8)		
			SWITCH UNIT (X13-5240-00)			
D1 -5	2J		B30-0469-05	LED(SLP-162B) PEAK LEVEL		
VR1	2J	*	R10-4024-05	POTENTIOMETER(50K) REC LEVEL		
S1	1J		S31-2062-15	SLIDE SWITCH (DOLBY NR)		
S2	1J	*	S42-2136-05	MULTIPLE PUSH SWITCH(DUB,SPEED		
			RECORD/PLAYBACK UNIT (X28-1750-00)			
C1 ,2			CK45FB1H561K	CERAMIC 560PF K		
C3 -8			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C9			CE04KW1V100M	ELECTRO 10UF 35WV		
C10			CF92FV1H223J	MF 0.022UF J		

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C11			CK45FB1H102K	CERAMIC 1000PF K		
C12			CF92FV1H104J	MF 0.10UF J		
C13 ,14			CQ09FS1H681J	POLYSTY 680PF J		
C15 ,16			CC45FSL1H101J	CERAMIC 100PF J		
C17		＊	C91-0811-05	POLYPRO 3300PF J		
C18			CF92FV1H102J	MF 1000PF J		
C19 ,20			CF92FV1H562J	MF 5600PF J		
C21			CE04KW1V4R7M	ELECTRO 4.7UF 35WV		
C22			CE04KW1H2R2M	ELECTRO 2.2UF 50WV		
C23			CE04KW1C330M	ELECTRO 33UF 16WV		
C24 ,25			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C26			CE04KW1V220M	ELECTRO 22UF 35WV		
C27 ,28			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C29 ,30			CE04KW1A470M	ELECTRO 47UF 10WV		
C31			CE04KW1E101M	ELECTRO 100UF 25WV		
C32			CE04KW1V4R7M	ELECTRO 4.7UF 35WV		
C33			CE04KW1V220M	ELECTRO 22UF 35WV		
C34			CE04KW1C101M	ELECTRO 100UF 16WV		
C35 ,36			CE04KW1C470M	ELECTRO 47UF 16WV		
C37			CE04KW1C221M	ELECTRO 220UF 16WV		
C38			CE04KW1E470M	ELECTRO 47UF 25WV		
C39 ,40			CC45FSL1H221J	CERAMIC 220PF J		
C41 -44			CE04KW1V4R7M	ELECTRO 4.7UF 35WV		
C45 -48			CE04KW1H010M	ELECTRO 1.0UF 50WV		
C49			CE04KW1C330M	ELECTRO 33UF 16WV		
C50			CE04KW1C470M	ELECTRO 47UF 16WV		
C51 ,52			CF92FV1H104J	MF 0.10UF J		
C53 ,54			CE04KW1V100M	ELECTRO 10UF 35WV		
C55			CE04KW1C101M	ELECTRO 100UF 16WV		
347	1K	＊	D10-1351-04	LEVER		
354	1K		E23-0125-05	TERMINAL		
J1	1K		E08-0503-05	RECTANGULAR RECEPTACLE		
J2	1K		E13-0126-05	PHONO JACK (1P) CD SYNCRO		
J3	1K		E13-0497-05	PHONO JACK (4P) LINE IN/OUT		
L1 ,2			L39-0126-05	TRAP COIL		
L3 ,4			L39-0107-05	TRAP COIL		
L5		＊	L32-0331-05	FM OSCILLATING COIL		
L7 ,8			L79-0164-05	LC FILTER		
T	1K		N09-1482-05	STEPPED SCREW (M2.6X6.5X2.5)		
R25			RD14GB2E100J	FL-PROOF RD 10 J 1/4W		
R27			RD14GB2E4R7J	FL-PROOF RD 4.7 J 1/4W		
R28			RD14GB2E151J	FL-PROOF RD 150 J 1/4W		
R29			RD14GB2E221J	FL-PROOF RD 220 J 1/4W		
R124			RD14GB2E101J	FL-PROOF RD 100 J 1/4W		
VR1 -4			R12-3096-05	TRIMMING POT.(10K) TAPE SPEED		
VR5 ,6			R12-5047-05	TRIMMING POT.(220K)BIAS ADJ		
S1	1K		S31-4014-05	SLIDE SWITCH (REC PLAY)		
S2	1K	＊	S40-2347-05	PUSH SWITCH (REC MUTE)		
D1 -35			1SS133	DIODE		
D1 -35			1SS176	DIODE		
IC1			AN6263N	IC(DPSS BLANK DETECT)		
IC2			TD62554S	IC(4CH TRANSISTOR ARRAY)		

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IC3			LB1416	IC(5PT LED LEVEL METER DRIVER)		
Q1 -6			2SC1740S(Q,R)	TRANSISTOR		
Q1 -6			2SC945(A)(Q,P)	TRANSISTOR		
Q7			2SA733(A)(Q,P)	TRANSISTOR		
Q7			2SA933S(Q,R)	TRANSISTOR		
Q8			2SC1740S(Q,R)	TRANSISTOR		
Q8			2SC945(A)(Q,P)	TRANSISTOR		
Q9			2SC2320(E,F)	TRANSISTOR		
Q11 -12			2SC945(A)(Q,P)	TRANSISTOR		
Q11 ,12			2SC1740S(Q,R)	TRANSISTOR		
Q13			2SD863	TRANSISTOR		
Q14 -16			2SC2320(E,F)	TRANSISTOR		
Q17			2SA733(A)(Q,P)	TRANSISTOR		
Q17			2SA933S(Q,R)	TRANSISTOR		
Q18			2SC1740S(Q,R)	TRANSISTOR		
Q18			2SC945(A)(Q,P)	TRANSISTOR		
Q19			2SD863	TRANSISTOR		
Q20 -23			2SC1740S(Q,R)	TRANSISTOR		
Q20 -23			2SC945(A)(Q,P)	TRANSISTOR		
Q24 -26			2SA733(A)(Q,P)	TRANSISTOR		
Q24 -26			2SA933S(Q,R)	TRANSISTOR		
Q27 ,28			2SC1740S(Q,R)	TRANSISTOR		
Q27 ,28			2SC945(A)(Q,P)	TRANSISTOR		
Q29			2SA733(A)(Q,P)	TRANSISTOR		
Q29			2SA933S(Q,R)	TRANSISTOR		
Q30 -38			2SC1740S(Q,R)	TRANSISTOR		
Q30 -38			2SC945(A)(Q,P)	TRANSISTOR		
Q39			2SA733(A)(Q,P)	TRANSISTOR		
Q39			2SA933S(Q,R)	TRANSISTOR		
Q40 -42			2SC1740S(Q,R)	TRANSISTOR		
Q40 -42			2SC945(A)(Q,P)	TRANSISTOR		
Q43 ,44			2SC2167	TRANSISTOR		
Q45 ,46			2SD1302(S)	TRANSISTOR		
Q47 ,48			2SC1845(F,E)	TRANSISTOR		
Q49 -51			2SC1740S(Q,R)	TRANSISTOR		
Q49 -51			2SC945(A)(Q,P)	TRANSISTOR		

DOLBY NOISE REDUCTION UNIT (X87-1010-00)

C1 ,2			CE04FW1C100MEL	ELECTRO	10UF	16WV	
C3 ,4			CE04FW1A221MEL	ELECTRO	220UF	10WV	
C5 ,6			CF92FV1H333J	MF	0.033UF	J	
C7 ,8			CE04FW1V4R7MEL	ELECTRO	4.7UF	35WV	
C9 ,10			CF92FV1H103J	MF	0.010UF	J	
C11 ,12			CF92FV1H183J	MF	0.018UF	J	
C13 ,14			CE04FW1HR33MEL	ELECTRO	0.33UF	50WV	
C15 ,16			CF92FV1H154J	MF	0.15UF	J	
C17 ,18			CE04FW1HR47MEL	ELECTRO	0.47UF	50WV	
C19 ,20		＊	CE04GW1HR68MEL	LL-ELEC	0.68UF	50WV	
C21 ,22			CC45FSL1H390J	CERAMIC	39PF	J	
C23 ,24			CF92FV1H562J	MF	5600PF	J	
C25 ,26			CF92FV1H472J	MF	4700PF	J	
C27 ,28			CF92FV1H822J	MF	8200PF	J	
C29 ,30			CE04FW1V4R7MEL	ELECTRO	4.7UF	35WV	
C31 ,32		＊	CF92FV1H823J	MF	0.082UF	J	
C33 ,34			CF92FV1H154J	MF	0.15UF	J	

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C35 ,36			CE04FW1HR47MEL	ELECTRO 0.47UF 50WV		
L1 ,2			L39-0106-05	TRAP COIL		
IC1 ,2		*	HA12058NT	IC(DOLBY B/C NOISE REDUCTION)		
RECORD AMPLIFIER UNIT (X87-1050-03)						
C1			CE04FW1HR22M	ELECTRO 0.22UF 50WV		
C2			CF92FV1H822J	MF 8200PF J		
C3			CF92FV1H183J	MF 0.018UF J		
C4			CE04FW1H010M	ELECTRO 1.0UF 50WV		
C5			CE04FW1V4R7M	ELECTRO 4.7UF 35WV		
C6			CF92FV1H102J	MF 1000PF J		
C7			CE04FW1V4R7M	ELECTRO 4.7UF 35WV		
C8		*	CF92FV1H203J	MF 0.020UF J		
C9 ,10			CF92FV1H683J	MF 0.068UF J		
C11			CF92FV1H563J	MF 0.056UF J		
C12		*	CF92FV1H203J	MF 0.020UF J		
C13			CF92FV1H104J	MF 0.10UF J		
C14			CF92FV1H473J	MF 0.047UF J		
C15			CF92FV1H823J	MF 0.082UF J		
C16			CF92FV1H273J	MF 0.027UF J		
C17			CF92FV1H153J	MF 0.015UF J		
L1			L40-4725-29	SMALL FIXED INDUCTOR(4.7MH,J)		
L2			L40-2225-29	SMALL FIXED INDUCTOR(2.2MH,J)		
VR1			R12-3101-05	TRIMMING POT.(22K) REC LEVEL		
IC1			BA6251	IC(7CH TRANSISTOR ARRAY)		
Q1			2SC1685(R,S)	TRANSISTOR		
Q1			2SC1740S(Q,R)	TRANSISTOR		
Q2			2SC1845(F,E)	TRANSISTOR		
Q2			2SC1980(S,T)	TRANSISTOR		
PLAYBACK AMPLIFIER UNIT (X87-1060-00)						
C1 ,2			CC45FSL1H271J	CERAMIC 270PF J		
C3 ,4			CE04KW1H2R2M	ELECTRO 2.2UF 50WV		
C5 ,6			CK45FB1H391K	CERAMIC 390PF K		
C7 ,8			CE04KW1A470M	ELECTRO 47UF 10WV		
C9 ,10			CF92FV1H822J	MF 8200PF J		
C11 ,12			CE04KW1V4R7M	ELECTRO 4.7UF 35WV		
C13 ,14			CF92FV1H183J	MF 0.018UF J		
C15			CE04KW1C330M	ELECTRO 33UF 16WV		
VR1 ,2			R12-3101-05	TRIMMING POT.(22K) PB LEVEL		
IC1			UPC1228HA	IC(PREAMP FOR TAPE EQ X2)		
Q1 ,2			2SC1685(R,S)	TRANSISTOR		
Q1 ,2			2SC1740S(Q,R)	TRANSISTOR		
CASSETTE MECHANISM ASS'Y (A) (D40-0357-05)						
5	2D		D01-0071-08	FLYWHEEL ASSY (H)		
6	1B		D03-0239-08	REEL DISK ASSY (T)		
7	1B		D03-0240-08	REEL DISK ASSY (S)		
22	2C		D10-1482-08	LEVER (STOP)		
23	2C		D10-1483-08	LEVER (FF H)		
24	2C		D10-1484-08	LEVER (REW H)		
25	2B		D10-1485-08	LEVER (REC B)		
26	3B		D10-1552-05	LEVER (EJECT F)		

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27	2A		D10-1487-08	LEVER ASSY (SHIFT)		
28	3A		D10-1488-08	LEVER ASSY (IDLER HT)		
29	1C		D10-1489-08	LEVER ASSY (PLAY S)		
30	2D		D10-1490-08	LEVER ASSY (LOCK CAM BS)		
31	3B		D10-1491-08	LEVER ASSY (RC LOCK N)		
32	1B		D10-1492-08	LEVER ASSY (CLUTCH)		
33	1C		D10-1493-08	LEVER ASSY (SOLENOID)		
34	2C		D10-1494-08	ARM (RC LOCK)		
35	1C		D10-1495-08	ARM (TRIGGER)		
36	2C		D10-1496-08	ARM (LOCK H)		
37	2C		D10-1497-08	ARM (AUTO B)		
38	2C		D10-1498-08	ARM (AUTO LOCK)		
39	2D		D10-1499-08	SLIDER (LOCK CAM C)		
40	3D		D10-1500-08	SLIDER (HEAD SHASSIS)		
41	1D		D10-1501-08	SLIDER (LOCK CAM S)		
45	1B		D13-0283-08	GEAR (FF)		
46	2C		D13-0284-08	GEAR (C)		
47	1C		D13-0285-08	GEAR (AUTO)		
48	1C		D13-0286-08	GEAR (AUTO CAM)		
50	2A		D14-0126-08	IDLER (PLAY)		
51	3B		D14-0127-08	PINCH ROLLER ASSY		
52	1C		D15-0237-08	PULLEY (AUTO)		
53	2D		D16-0119-08	BELT (DRIVE)		
54	1D		D16-0120-08	BELT (FR)		
55	2C		D16-0121-08	BELT (AUTO)		
56	1B		D19-0077-08	CLUTCH (AUTO)		
57	3B		D21-1100-08	EXTENSION SHAFT(BUTTON)		
58	1D		D23-0204-08	RETAINER ASSY (CAPSTAN)		
59	2C		D23-0205-08	RETAINER ASSY (HOUSING)		
60	1B		D33-0018-08	LINING (AUTO CLUTCH)		
64	2A		F07-0471-08	COVER (SWITCH)		
68	2C		G01-1686-08	COMPRESSION SP (FF LEVER)		
69	2C		G01-1687-08	COMPRESSION SP (REW LEVER)		
70	1C		G01-1688-08	COMPRESSION SP (LEVER)		
71	3A		G01-1689-08	COMPRESSION SP (HEAD)		
72	1B		G01-1690-08	COMPRESSION SP (BACK TENSION)		
73	1B		G01-1691-08	COMPRESSION SP (AUTO CLUTCH)		
74	2A		G01-1692-08	TENSION SPRING (SHIFT ARM C)		
75	3A,1D		G01-1693-08	TENSION SPRING (CAM)		
76	3A		G01-1694-08	TENSION SPRING (HEAD SHASSIS)		
77	1D		G01-1695-08	TENSION SPRING (EJECT LEVER)		
78	1B		G01-1696-08	TENSION SPRING (CLUTCH ARM)		
79	3B		G01-1697-08	TENSION SPRING (RC LOCK ARM)		
80	1C		G01-1698-08	TENSION SPRING (SOLENOID ARM)		
81	2B		G01-1699-08	TORSION COIL SP(REC LEVER)		
82	3A		G01-1700-08	TORSION COIL SP(HEAD SHASSIS)		
83	3A		G01-1701-08	TORSION COIL SP(PINCH ROLLER)		
84	2C		G01-1702-08	TORSION COIL SP(LOCK ARM H)		
85	1C		G01-1703-08	TORSION COIL SP(AUTO SENSOR)		
86	2C		G01-1704-08	TORSION COIL SP(AUTO LOCK ARM)		
88	1C		G01-1706-08	TORSION COIL SP(TRGGER ARM)		
89	2C		G01-1707-08	TORSION COIL SP(RC ARM)		
92	2B		G02-0197-05	FLAT SPRING (PACK T)		
93	1D		G11-1120-08	CUSHION (MOTOR)		

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CIRCUIT DESCRIPTION

Recording/Playback Unit (X28-1750-00)

Component	Use/Function	Operation/Conditions/Interchangeability
Q28, 29	Muting circuit	Deck A STOP→PLAY or PLAY→STOP Dubbing SW OFF→ON or ON→OFF Deck A FF, REW or program selection operation: Deck A and B STOP: Q28, 29 ON
Q30, 33	Dubbing SW ON/OFF selection mute signal	Dubbing SW OFF, Deck A PLAY: Dubbing SW ON: Q30, 33 ON
Q31	Muting control circuit	Dubbing SW OFF: Dubbing SW ON (Deck A STOP), turntable (P-3S) or CD player (DP-7S) PLAY: Q31 ON
Q32	Muting control circuit	Q33, 34 OFF, Deck B REC or PLAY: Q32 ON
Q34	Muting control circuit	Deck A PLAY: Q34 ON STOP and Deck B PLAY: Q34 OFF
Q35	Dolby selection signal control circuit	Q36 OFF, Deck A PLAY: Q35 ON (Dolby OFF)
Q36, 38	REC/PLAY selection signal control circuit	Dubbing SW OFF: QW36 ON→Q35 OFF Dubbing SW ON, turntable (P-3S) or CD player (DP-7S) PLAY: Q38 ON→Q37 OFF
Q37	REC/PLAY selection signal control circuit	Q38 OFF, Deck A PLAY: Q3 ON (Dolby playback mode)
Q39, 40	Muting circuit	Q40 OFF: Q39 OFF (mute OFF) Q40 ON: Q39 ON (mute ON)
Q41	Muting control circuit	Deck A PLAY: Q41 ON→Q40 OFF Deck B PLAY or REC: Q39 OFF (mute OFF)
Q42	Power ON/OFF muting control circuit	Power OFF: Q42 OFF Power ON: Q42 ON
Q43	Motor system power supply ripple filter	
Q44	Signal system power supply ripple filter	
Q45, 46	Line muting circuit	Q29 ON or Q39 ON: Q45, 46 ON (mute ON)

REGLAGE

N°	ITEM	REGLAGE DE L'ENTREE	REGLAGE DE LA SORTIE	REGLAGE DU MAGNETO-PHONE A CASSETTE	POINTS DE L'ALIGNEMENT	ALIGNER POUR	FIG.
SECTION DU MAGNETOPHONE		TAPE: NORMAL, DOLBY: OFF, ENTREE: LINE					0dBs=0,775V
I TETE D'ENREGISTREMENT/LECTURE							
[1]	DEMAGNETISATION	–	–	POWER: OFF Eloigner la porte.	Tête D'ENREGISTREMENT/ LECTURE	Demagnétiser la tete D'ENREGISTREMENT/LECTURE avec un démagnétiseur de tete.	
[2]	NETTOYAGE	–	–	PLAY	Tete D'ENREGISTREMENT/ LECTURE tete d'effacement, cabestan, galetpresseur.	Nettoyer la tete D'ENREGISTREMENT/LECTURE la tete d'effacement, le cabestan et le galetpresseur avec un coton-tige légèrement imbibé d'alcool.	
[3]	AZIMUT	MTT-114 10kHz	(B)	PLAY	Vis d'azimut	Sortie maximer.	
II PLAQUE IMPRIMEE							
<i>	VITESSE DE DEFILEMENT (HI SPEED)	MTT-111 3kHz	(B)	Connecter un cablage enter les GND et TP1.TP2 PLAY	A DECK: VR2 B DECK: VR4	Régler la vitesse de bande de façon qu'un signal de 6kHz soit produit au centre de la bande.	
<ii>	VITESSE DE DEFILEMENT (NORMAL)	MTT-111 3kHz	(B)	Disconnect the TP1,TP2 PLAY	A DECK: VR1 B DECK: VR3	Régler la vitesse de bande de façon qu'un signal de 3kHz soit produit au centre de la bande.	
III PLAQUE IMPRIMEE (X87-1060-00)							
<1>	NIVEAU DE LECTURE	(a) MTT-150 400Hz	(B)	PLAY	A DECK: VR1 (G) VR2 (D) B DECK: VR1 (G) VR2 (D)	Niveau de sortie: -6,0dBs	
		(b) MTT-256 315Hz				Niveau de sortie: -9,0dBs	
		(c) MTT-256U 315Hz				Niveau de sortie: -5,0dBs	
<2>	COURANT DE POLARISATION	(A) 1kHz.-30dBs 10kHz.-30dBs	(B)	Régler REC de façon que la sortie de moniteur REC soit de -29dBs à 1kHz, puis en registrer et reproduire des signaux de 1kHz et 10kHz en alternance.	(X28-1750-00) VR5 (G) VR6 (D)	Enregistrer un signal de 1kHz et 10kHz en alternance et ajuster les résistances variables qui commandent le courant de polarité de façon à obtenir le même niveau de lecture.	
<3>	NIVEAU D'ENREGISTREMENT	(A) 1kHz.-10dBs	(B)	Enregistrer et reproduire un signal de 1kHz dans les conditions précisées en <2>	(X87-1050-00) VR1 (G) VR1 (D)	Ajuster les résistances variables de façon à obtenir un niveau de lecture de -9dBs.	

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96	2B		J19-2543-08	HOLDER (TRIGGER)		
97	3B		J21-3729-05	MOUNTING HARDWARE (BUTTON B)		
98	3C		J19-2545-08	HOLDER (LEVER A)		
99	2B		J19-2546-08	HOLDER (LEVER B)		
100	3A		J19-2547-08	HOLDER (HEAD BASE)		
101	2C		J19-2548-08	BRACKET (SOLENOID)		
102	1B		J19-2549-08	HOLDER (REEL BASE B)		
103	1D		J21-3646-08	MOUNTING HARDWARE (MOTOR)		
104	3A		J30-0202-05	SPACER (HEAD)		
105	3A		J31-0251-08	COLLAR		
106	1B		J42-0132-08	POWER CORD (FF GEAR)		
107	1C,2C		J42-0133-08	POWER CORD		
109	3B		J31-0252-08	COLLAR (BUTTON)		
–			J61-0307-05	WIRE BAND		
112	1B,1C		N19-0298-05	FLAT WASHER (Ø1.7XØ3.5XO.25		
113	2A		N19-0365-04	FLAT WASHER (Ø1.2XØ3.5XO.25		
114	2C		N19-0524-04	FLAT WASHER (Ø2.1XØ5.0XO.25		
115	2B		N19-0935-08	FLAT WASHER (Ø2.6)		
116	2A		N19-0936-08	FLAT WASHER (REEL DISK)		
117	2B		N19-0937-08	FLAT WASHER (Ø1.9XØ5.0XO.5		
118	1D		N19-0938-08	FLAT WASHER (Ø3.2XØ6.0XO.3		
119	2B,1D		N29-0206-04	E TYPE RETAINING RING (Ø2)		
A	2B		N09-1220-05	SCREW (Ø2.6X5)		
B	3A		N09-1242-08	SCREW (M2X9)		
C	2A		N09-1431-05	SCREW (Ø2X6)		
D	2B,2C		N09-1496-08	SCREW (Ø2X4)		
E	3A		N09-1497-08	SCREW (Ø2X5)		
F	2C		N09-1498-08	SCREW (Ø2X8)		
G	2C		N09-1499-08	SCREW (Ø2X12)		
H	2B,1D		N09-1500-08	SCREW (Ø2.6X4)		
J	3B		N09-1501-08	SCREW (Ø2.6X5)		
K	1B		N09-1502-08	SCREW (Ø2.6X8)		
M	2C		N09-1504-08	SCREW (Ø2.6X22)		
N	3A		N09-1505-08	SCREW (M2X8.5)		
P	2C		N09-1506-08	SCREW (Ø2.6X10)		
Q	3A,3B		N09-1507-08	SCREW		
R	1D		N09-1508-08	SCREW		
S	2C		N09-1509-08	SCREW		
T	2C		N09-1510-08	SCREW		
U	1D		N09-1511-08	SCREW (MOTOR)		
S1	2B		S46-1061-08	LEAF SWITCH (CROZ)		
S2	2B		S46-1062-08	LEAF SWITCH (PB)		
S3	2C		S46-1063-08	LEAF SWITCH (FF,REW)		
130	3A		T32-0308-05	ERASE HEAD		
131	3A		T34-0313-08	REC/PLAY HEAD		
132	1D		T42-0074-08	MOTOR ASSY		
133	2C		T94-0087-08	SOLENOID COIL		
140	2H		A11-0156-08	SUB CHASSIS ASSY (C)		
141	2G		A11-0157-08	SUB CHASSIS ASSY (B)		
145	3F		D01-0068-08	FLYWHEEL ASSY (P)		
146	3F		D01-0069-08	FLYWHEEL ASSY (F)		
147	2G		D03-0237-08	REEL DISK ASSY (TAKE UP)		

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CASSETTE MECHANISM ASS'Y (B) (D40-0323-05)						
148	2G		D03-0238-08	REEL DISK ASSY (SUPPLY)		
149	2G		D10-1413-08	LEVER (REC)		
150	2G		D10-1414-08	LEVER (EJECT)		
151	3F		D10-1415-08	LEVER (PLAY)		
152	2F		D10-1416-08	LEVER (MUTE SWITCHOVER		
153	3F		D10-1417-08	LEVER (PAUSE)		
154	3G		D10-1418-08	LEVER (REVERSE PREVENTION		
155	3G		D10-1419-08	LEVER (REVERSE)		
156	2G		D10-1420-08	LEVER (REC B)		
157	2E		D10-1421-08	LEVER (PAUSE KEY)		
158	2E		D10-1422-08	LEVER (PLAY KEY)		
159	2G		D10-1423-08	LEVER		
160	2G		D10-1424-08	LEVER (PAUSE)		
161	2G		D10-1425-08	LEVER (AUTO RELEASE)		
162	2H		D10-1426-08	LEVER (AUTO KICK)		
163	3F		D10-1427-08	LEVER (REC A)		
164	1H		D10-1428-08	LEVER (A)		
165	1G		D10-1429-08	LEVER (B)		
166	2F		D10-1430-08	LEVER		
167	2G		D10-1431-08	LEVER (REC RELEASE,A)		
168	1G		D10-1432-08	LEVER (REC RELEASE)		
169	2G		D10-1433-08	LEVER (REC RELEASE,B)		
170	1G		D10-1434-08	LEVER (MODE SWITCHOVER		
171	1G		D10-1435-08	LEVER (MANUAL)		
172	1G		D10-1436-08	LEVER (F)		
173	1F,1G		D10-1437-08	LEVER (R)		
174	1G		D10-1438-08	LEVER (R)		
175	1G		D10-1439-08	LEVER ASSY (SWITCHOVER,A)		
176	1F		D10-1440-08	LEVER ASSY (PLAY GEAR,F)		
177	1F		D10-1441-08	LEVER ASSY (PLAY GEAR,R)		
178	2G		D10-1442-08	LEVER ASSY (PLAY)		
179	3F		D10-1443-08	LEVER ASSY (INVERT)		
180	2F		D10-1444-08	LEVER ASSY (HEAD SWITCHOVER		
181	2H		D10-1445-08	LEVER ASSY (PAUSE)		
182	2G		D10-1446-08	LEVER ASSY		
183	1G		D10-1447-08	LEVER ASSY (MODE A)		
184	1H		D10-1448-08	LEVER ASSY (AUTO A)		
185	3E		D10-1449-08	SLIDER (R/P SW)		
186	2H		D10-1450-08	SLIDER ASSY (MOTOR SW)		
187	2G		D10-1451-08	SLIDER ASSY (LOCK)		
188	2G		D10-1452-08	SLIDER ASSY (DPSS)		
189	2F		D10-1453-08	SLIDER ASSY (PINCH ROLLER)		
190	2F		D10-1454-08	SLIDER ASSY		
191	1F		D10-1455-08	SLIDER (PAUSE)		
192	2H		D10-1456-08	SLIDER (STOP)		
193	2H		D10-1457-08	SLIDER (FF)		
194	2H		D10-1458-08	SLIDER (PLAY)		
195	2H		D10-1459-08	SLIDER (REW)		
196	2H		D10-1460-08	SLIDER (REC PLATE)		
197	2G		D10-1461-08	SLIDER (AUTO)		
198	2G		D10-1462-08	SLIDER (CASSETTE LID LOCK		
199	2G		D10-1463-08	SLIDER (REC)		
200	2G		D10-1464-08	SLIDER (REC RELEASE,A)		
201	1H		D10-1465-08	SLIDER (REC RELEASE,B)		
202	1G		D10-1466-08	SLIDER (MODE B)		

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203	1G		D10-1467-08	SLIDER		
204	3E		D10-1468-08	ROD (OPERATION KEY)		
206	1G		D12-0108-08	CAM		
207	3F		D13-0272-08	GEAR (PLAY)		
208	2G		D13-0273-08	GEAR (PAUSE CAM)		
209	2H		D13-0274-08	GEAR (REVERSE CAM)		
210	1H,2H		D13-0275-08	GEAR (PLAY)		
211	2H		D13-0276-08	GEAR (REVERSE B)		
212	1H		D13-0277-08	GEAR (AUTO STOP)		
213	2G		D13-0278-08	GEAR (FF)		
214	2E		D13-0279-08	GEAR (SEGMENT)		
215	2E		D13-0280-08	GEAR (HEAD)		
216	2H		D13-0281-08	GEAR (REVERSE C)		
217	2F		D14-0124-08	PINCH ROLLER ASSY (F)		
218	2E		D14-0125-08	PINCH ROLLER ASSY (R)		
219	2F		D15-0235-08	PULLEY ASSY (FR)		
220	3F		D16-0117-08	BELT (MAIN)		
221	3F		D16-0118-08	BELT (FRB)		
222	2G		D19-0076-08	CLUTCH		
223	3E,3F		D23-0203-08	RETAINER (FLYWHEEL)		
224	1H		D30-0016-08	BRAKE		
225	2F		D90-0027-08	STEEL BALL (1.2)		
229	2E		F20-0353-08	INSULATING BOARD		
230	2E		F31-0150-08	REINFORCING HARDWARE		
235	1G		G01-1630-08	COMPRESSION SP (LOCK PLATE)		
236	3F		G01-1631-08	COMPRESSION SP (FLYWHEEL)		
237	2G		G01-1632-08	COMPRESSION SP (AUTO)		
238	1H		G01-1633-08	COMPRESSION SP (AUTO LEVER)		
239	2E		G01-1634-08	COMPRESSION SP (AZIMUTH)		
240	2G		G01-1635-08	COMPRESSION SP (AUTO A)		
241	2E,2F		G01-1636-08	COMPRESSION SP (PINCH ROLLER)		
242	3E		G01-1637-08	TENSION SPRING (SWITCHOVER)		
243	2F		G01-1638-08	TENSION SPRING		
244	2G		G01-1639-08	TENSION SPRING (PLAY LEVER)		
245	2F		G01-1640-08	TENSION SPRING (PAUSE)		
246	2H		G01-1641-08	TENSION SPRING (DPSS)		
247	2H		G01-1642-08	TENSION SPRING (LOCK)		
248	2F		G01-1643-08	TENSION SPRING (FR)		
249	1F,2G		G01-1644-08	TENSION SPRING (AUTO RELERSE)		
250	1H		G01-1645-08	TENSION SPRING (BRAKE)		
251	1H		G01-1646-08	TENSION SPRING (REC A)		
252	2G		G01-1647-08	TENSION SPRING (SLIDER R)		
253	1G		G01-1648-08	TENSION SPRING (MODE A)		
254	1G		G01-1649-08	TENSION SPRING (MODE B)		
255	1G		G01-1650-08	TENSION SPRING (D LEVER)		
256	1F,2F		G01-1651-08	TENSION SPRING		
257	2G,3G		G01-1652-08	TENSION SPRING (TRIGGER LEVER)		
258	2F		G01-1653-08	TENSION SPRING (PINCH ROLLER)		
259	1G		G01-1654-08	TENSION SPRING (REC RELEASE)		
260	3F		G01-1655-08	TENSION SPRING		
261	2G		G01-1656-08	TENSION SPRING (PAUSE)		
262	2F		G01-1657-08	TORSION SPRING (PINCH ROLLER,F		
263	2E		G01-1658-08	TORSION SPRING (PINCH ROLLER,R		
264	2E		G01-1659-08	TORSION SPRING (OPERATION KEY)		

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265	2H		G01-1660-08	TORSION SPRING (REC)		
266	2E		G01-1661-08	TORSION SPRING (GEAR SEGMENT)		
267	2G		G01-1662-08	TORSION SPRING (REC RELEASE C)		
268	2G		G01-1663-08	TORSION SPRING (MODE A LEVER)		
269	2H		G01-1664-08	TORSION SPRING (FF KEY)		
270	1G		G01-1665-08	TORSION SPRING (REC RELERSE)		
271	1G		G02-0367-08	FLAT SPRING		
272	2F		G02-0368-08	FLAT SPRING		
276	3F		J19-0306-05	LEAD HOLDER		
277	2E		J19-2538-08	HOLDER (HEAD BASE)		
278	2E		J21-3638-08	MOUNTING HARDWARE (UP KEY)		
279	2E		J21-3639-08	MOUNTING HARDWARE (HEAD)		
280	1G		J21-3640-08	MOUNTING HARDWARE (MODE)		
281	3E		J21-3641-08	MOUNTING HARDWARE (MOTOR)		
282	3F		J31-0250-08	COLLAR		
283	2H		J90-0154-08	GUIDE		
A	2E		N09-1487-08	SCREW (AZIMUTH)		
B	2E		N09-1488-08	SCREW (Ø1.6X5.5)		
C	2H		N09-1489-08	SCREW (Ø2X5)		
D	2G,3G		N09-1490-08	SCREW (Ø2.6X3)		
E	1G,2G		N19-0298-05	FLAT WASHER (Ø1.7XØ3.5X2)		
F	3F		N19-0367-08	FLAT WASHER (Ø2.5XØ4.5X2)		
G	2E,2F		N19-0524-04	FLAT WASHER (Ø6XØ2.1X0.25)		
H	2E		N19-0891-04	FLAT WASHER (Ø2.6XØ4.7X0.5)		
K	1G		N19-0928-08	FLAT WASHER (Ø5.8X0.5)		
L	2E		N19-0929-08	FLAT WASHER (Ø3.4XØ8X0.5)		
M	2G		N19-0930-08	FLAT WASHER (Ø3XØ1.7X0.2)		
N	2G,2G		N19-0931-08	FLAT WASHER (Ø1.7XØ3.5X0.2)		
P	2F,1G		N29-0205-04	E TYPE RETAINING RING (Ø1.5)		
Q	1F,1G		N29-0206-04	E TYPE RETAINING RING (Ø2.0)		
R	2G,1H		N29-0207-04	E TYPE RETAINING RING (Ø2.5)		
S4	3G		S46-1057-08	LEAF SWITCH (MOTOR ON/OFF)		
S5 ,6	1F		S46-1056-08	LEAF SWITCH (METAL,CR02)		
S7	2G		S46-1058-08	LEAF SWITCH (PLAY)		
S8	1F		S46-1058-08	LEAF SWITCH (DIRECTION)		
288	2E		T34-0312-08	REC/PLAY HEAD		
289	3E		T42-0071-08	DC MOTOR ASSY		

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SPECIFICATIONS

X-3WS

Type ..... Stereo-Double Cassette Deck with Dolby B/C NR System and Direct Program Search System
Track system ..... 4-Track, 2-Channel Stereo/Mono, Recording/Playback
Recording system ..... AC Bias System (Bias Frequency: 105 kHz)
Erasing system ..... AC System
Tape speed ..... 4.76 cm/sec (1-7/8 ips)
Heads
- **Record and playback** ..... Hard Permalloy Head
- **Playback** ..... Hard Permalloy Head
- **ERASE** ..... Double Gap Ferrite Head

Motor ..... Electronically Controlled DC Motor ×2
Fast winding time ..... Approx. 105 seconds with C-60 tape
Frequency response:
- **Normal tape** ..... 20 Hz to 15,000 Hz (30 Hz to 14,000 Hz, ±3 dB)
- **CrO_2 tape** ..... 20 Hz to 16,000 Hz (30 Hz to 14,000 Hz, ±3 dB)
- **Metal tape** ..... 20 Hz to 16,000 Hz (30 Hz to 14,000 Hz, ±3 dB)

Signal-to-Noise ratio:
- **Dolby C type NR ON** ..... 72 dB (Metal Tape)
- **Dolby B type NR ON** ..... 65 dB (Metal Tape)
- **Dolby NR OFF** ..... 57 dB (Metal Tape)

Wow and flutter ..... 0.09% (W.R.M.S.) ±0.28% (DIN)
Input sensitivity/impedance:
- **LINE ×2** ..... 77.5 mV/50 kohms
- **Microphones ×2** ..... For Low Impedance (600 Ω) Microphone

Output level/load impedance:
- **LINE ×2** ..... 270 mV/3.9 kohms
- **Headphones** ..... For 8 Ω Headphones

Dimensions ..... W: 340 mm (13-3/8")
H: 119 mm (4-11/16")
D: 353 mm (13-7/8")
Weight ..... Net 4.2 kg (9.24 lb)
Reference tapes ..... Normal: KENWOOD ND-60 or TDK AD C-60
CrO_2: KENWOOD CD-60 or TDK SA C-60
Metal: KENWOOD MD-60 or TDK MA C-60

Kenwood follows a policy of continuous advancements in development.
For this reason specifications may be changed without notice.
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X-3WS

CAUTION

PRECAUTIONS FOR REPAIR

MIDI M-3S has a power supply unit only in amplifier A-5S and power transformers are not incorporated in other sets (tuner, cassette tape deck, etc.). At the occasion of repair to a set that is other than the amplifier, use the power supply unit of amplifier A-5S, and supply power to another set using a system control connection cord.

The combination of MIDI M-3S is as follows. When a repair to MIDI M-3S is requested, be sure to advise the customer to ship together with amplifier A-5S.

System name	Amplifier	Tuner	Cassette tape deck	Turntable
MIDI M-3S	A-5S	T-3S/T-3LS	X-3WS	P-3S

Note:
Component and circuitry are subject to modification to insure best operation under differing local conditions. This manual is based on the Europe (E) standard, and provides information on regional circuit modification through use of alternate schematic diagrams, and information on regional component variations through use of parts list.

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